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Effects of Platform Design on the Customer Experience in an Online Solar PV Marketplace

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Summary

Residential solar photovoltaic (PV) customers are increasingly buying PV systems in online marketplaces, where customers can compare multiple quotes from several installers on quote platforms. In this study, we use data from an online marketplace to explore how quote platform design affects customer experiences. We analyze how four design changes affected customer experiences in terms of factors such as prices. We find that three of the four design changes are associated with statistically significant and robust price reductions, even though none of the changes were implemented specifically to reduce prices. The results suggest that even seemingly small platform design changes can affect PV customer experiences in online marketplaces.

Context

Most residential PV customers procure PV by obtaining quotes directly from installers. More recently, customers are increasingly obtaining quotes through online quote marketplaces. Online PV transactions generally proceed in three steps:

1. A customer provides basic information about their home and system preferences, which is shared with a network of installers operating in the customer's market.
2. An interested installer posts installation quotes to an online quote platform.
3. The customer compares the quotes and selects a preferred option (Figure 1).

Quote platforms can vary in terms of several design features, such as what information is required from customers in Step 1 and from installers in Step 2, and what information is provided to these two parties (Figure 2). Different quote platform designs may yield different customer experiences in online marketplaces.

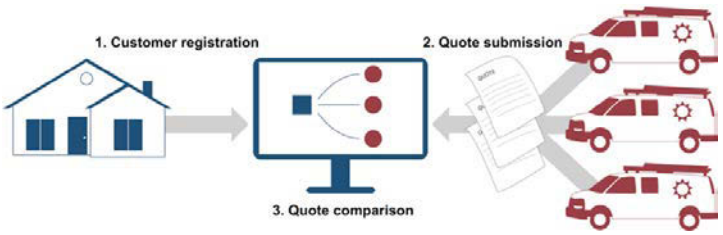

Figure 1. Online quote platforms

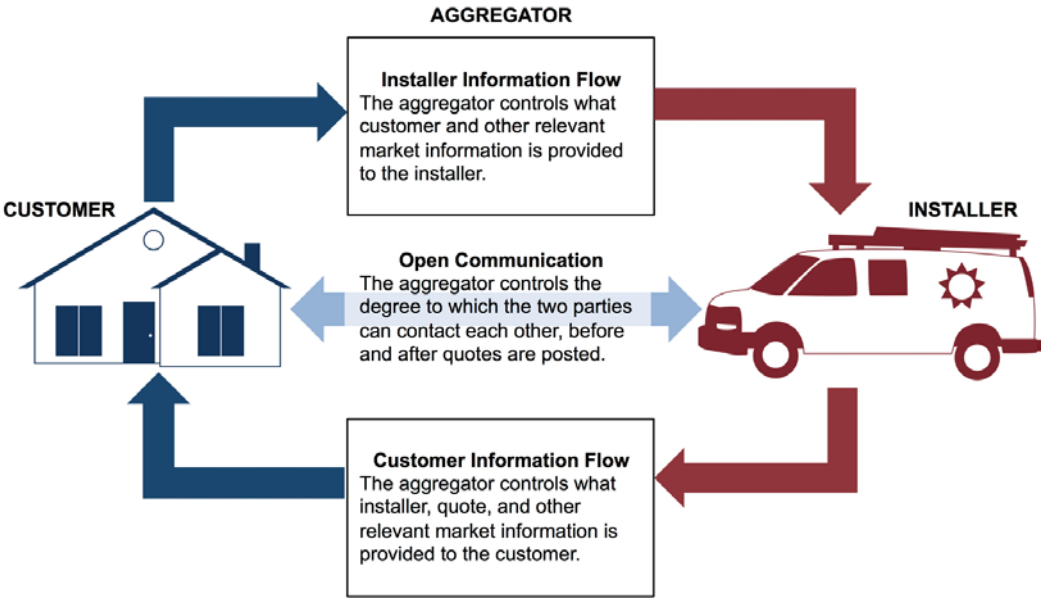

Figure 2. Quote platform design elements
"Aggregator" refers to the marketplace organizer responsible for aggregating quotes on behalf of customers.

Data and Methods

In this study, we use data from 136,555 residential PV quotes provided by the online marketplace EnergySage. EnergySage also shared information about four design changes implemented to their platform from 2016 to 2017 (see Table 1). We then test the values of customer experience variables before and after these changes. We also use a regression discontinuity approach to test the effects of the changes on offer prices.

Results and Conclusions

Table 1 summarizes the effects of the four design changes on customer experiences on the EnergySage online marketplace (see the full technical report for a more comprehensive discussion of results). Three of the four design changes are associated with positive impacts on the customer experience; analysis of the fourth change yielded inconclusive results. The outcomes are consistent with EnergySage's objectives in implementing the changes. Furthermore, each design change is associated with a reduction in offer prices. The Effect on Prices column displays these price reductions as measured through a regression discontinuity model. For reference, the average price in the data was about $3.39/watt (W), so that a reduction of $0.1/W represents about a 3% reduction in prices. Note that the effects reflect price reductions after controlling for other factors, including the influence of falling prices in the market overall. Three of the four effects are statistically significant and robust under additional model specifications. This finding is particularly interesting, given that none of the design changes were implemented to explicitly affect prices. The results suggest that seemingly small design changes can affect customer experiences, possibly in unintended ways.

More Information

For more information, download the full technical report: Leibowicz, Benjamin, Eric O'Shaughnessy, Kunal Punjabi, and Robert Margolis. 2018. *Effects of Platform Design on the Customer Experience in an Online Solar PV Marketplace*. NREL/TP-6A20-71178. https://www.nrel.gov/docs/fy18osti/71178.pdf.

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Table 1. Summary of Effects of Four Design Changes

Design Change	Effect on Customer Experience	Effect on Prices[a]
Customer map: Potential new customers can view a map of all online marketplace customers in their area.	Associated with an increase in site registration, suggesting that the map improved consumer confidence in the marketplace	-$0.04/W[b]
Quote cap: Customers can receive no more than seven quotes on the platform.	Associated with an increase in the percentage of interested installers that ultimately submit quotes	-$0.05/W[c]
Price guidance: Installers can view average prices in the customer's area.	Associated with a reduction in price variability	-$0.10/W[c]
No pre-quote messaging: Installers are prohibited from messaging customers before providing a quote.	Effects are unclear; objective is to discourage off-platform bidding and sales tactics	-$0.05/W[b]

a. Coefficient from regression discontinuity model

b. Effect statistically significant at $p<0.01$

c. Effect statistically significant at $p<0.01$ and robust to subsequent checks

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